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10/666,723	09/17/2003	Chaohuang Zeng	ATHEP122	6055

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EXAMINER	
SINGH, HIRDEPAL	
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2611	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/666,723	ZENG ET AL.	
	Examiner	Art Unit	
	HIRDEPAL SINGH	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,20,23 and 24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,20,23 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on July 25, 2008 with a request for continued examination. Claims 1-14, 20 and 23-24 are pending and have been considered below.

Response to Arguments

2. Applicant's arguments with respect to claims 1-14, 20 and 23-24 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 10, 12, 20, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in view of Muratani et al. (7,123,744) and further in view of Chang et al. (US 2004/0146091).

Regarding claims 1 and 20:

Marshall discloses a system and method for sampling a received signal to produce a sequence of samples wherein the sequence of samples includes a plurality of subsequences of samples' (figure 5, elements 303 & 304, col.2, lines 57-64), 'cross correlating the subsequences of samples with a known form of the subsequence to

produce one cross correlation for each of the plurality of subsequences of samples' (see Abstract, lines 1-6, figure 5, element 307 & figure 8, col.3, lines 4-40).

Marshall also processes the digital correlated values (figure 15) except for specifically teaching, wherein (1) at least one cross correlation is adjusted in sign according to a secondary code, thereby reducing a plurality of offset correlation peaks offset a period of one subsequent apart from a largest correlation peak; and (2) self correlation the cross correlation.

Regarding item (1) above, Chang in the same field of endeavor discloses a system and method for carrier sensing, signal and link quality where the receiver detects incoming signal packet (paragraphs 0005 and 0018), at least one cross correlation is adjusted in sign according to a secondary code (as shown in figures 1a and 2 of Chang, similar to the present invention code shown in figure 2b), thereby reducing a plurality of offset correlation peaks offset a period of one subsequent apart from a largest correlation peak (paragraph 0005).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention, to implement the teachings of Chang into Marshall in order to achieve symbol synchronization in the communications system by detecting the training pulse through pulse train detector and enhance quality of communication by carrier sensing, signal and link quality in a simple way.

Regarding item (2) above, Muratani auto correlating (self correlation) the cross correlation (figure 3, elements 31 & 34, col.7, lines 5-10) and produce plurality of self correlations (figure 9, elements 38, col.11, lines 30-43) (it is noted that in figure 9

Muratani discloses circuits 91 to 9N each includes auto correlation units which generates plurality of outputs which are combined (figure 9, element 18 & figure 10, col. 11, lines 28-34 & 39-43)(claimed 'summing the self correlations') and output as a whole as the detecting result 38 (figure 10, col.11, lines 39-43) and thus reads on claim limitations of 'self correlating the cross correlations to produce a plurality of self correlations' and 'summing the self correlations').

Therefore, It would have been obvious to one of ordinary skill in the art, at the time invention was made, to implement the teachings of Muratani into Marshall in order to determine the peak position and period of the number sequence by auto correlating (self correlating) the cross correlation in order to detect the target value as taught by Muratani (col.4, lines 3-14).

Regarding claim 10:

Marshall discloses all of the subject matter as described above except for specifically teaching pseudorandom sequence.

Muratani teaches auto correlations (claimed 'self correlation') according to a pseudo-random sequence (figure 3, elements 32, 31 & 35) (claimed 'self correlations according to a pseudorandom sequence').

It would have been obvious to one of ordinary skill in the art, at the time invention was made, to implement the teachings of Muratani into Marshall, ran and Bohnke in order to determine the peak position and period of the number sequence by using the pseudorandom sequence for auto correlating (self correlating) the cross correlation in

order to detect the target value as taught by Muratani (col.4, lines 3-14 & 63-67, col.5, lines 1-7).

Regarding claim 12:

Marshall discloses all of the subject matter as described above and further discloses resetting upon the occurrence of an automatic gain control adjustment' (figure 13, element 701, 'average digital AGC', col.8, lines 30-61).

Regarding claims 23 and 24:

Marshall discloses all of the subject matter as described above except for specifically teaching that adjusting the sign comprises changing sign of each bit in subsequence and the secondary code is pseudorandom code.

However, Chang in the same field of endeavor discloses a system and method for carrier sensing, signal and link quality where adjusting the sign comprises changing sign of each bit in subsequence (figures 1a and figure 2) and the secondary code is pseudorandom code (paragraph 0005).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention, to implement the teachings of Chang into Marshall in order to achieve symbol synchronization in the communications system by detecting the training pulse through pulse train detector and enhance quality of communication by carrier sensing, signal and link quality in a simple way.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in view of Muratani et al. (7,123,744) further in view of Chang et al. (US

2004/0146091), as applied to claim 1 above, and further in view of Bohnke et al. (2006/0269008).

Regarding claim 9:

Marshall discloses all of the subject matter as described above and also discloses adjusting the signal of cross correlation, except for specifically teaching adjustment of the sign of self correlations according to a known sequence.

Bohnke teaches, 'summing the self correlations includes adjusting the sign of the self correlations according to a known sequence' (figures 2 & 6, page # 1, paragraphs # 0009-0012, page # 3, paragraph # 0044, page # 4, paragraph # 0046) (it is noted in the figure 6 cross correlated values 16 are being multiplied by complex conjugated samples (claimed 'self cross correlation') (in the light of Specification, page # 9, lines 10-11) of an expected repetition pattern (claimed 'known sequence') before they are summed by SUM (figure 6) (claimed 'summing the self correlation'). Furthermore, Bohnke discloses that in figure 6, cross correlation peak of the repetition pattern are also detected by '+' & '-' values of phase (page # 3 - 4, paragraph # 0044) which reads on claim limitations of 'adjusting the signal').

Therefore, It would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the teachings of Bohnke into Marshall, in order to provide the phase information thus information on the position of the correlation peak in the reference symbol and thus a more accurate and reliable synchronization information as taught by Bohnke (page # 4, paragraph # 0045).

6. Claims 2-6, 8, 11, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in views of Muratani et al. (7,123,744) and Chang et al. (US 2004/0146091), as applied to claim 1 above, and further in view of Husted et al. (2002/0183027).

Regarding claim 2:

Marshall discloses all of the subject matter as described above except for specifically teaching comparing of magnitude of the sum of the self correlations to a threshold.

Husted teaches, 'processing the sum of the self correlations includes comparing the magnitude of the sum of the self correlations to a threshold' (page # 5, paragraphs # 0060-0065).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to implement the teachings of Husted into Marshall in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

Regarding claims 3, 4 and 5:

Marshall discloses all of the subject matter as described above except for specifically teaching a first and second threshold and comparison of the summed magnitude of the self correlation.

Husted discloses two threshold windowing process on a self correlation measurement (page 5, paragraph 0065) (claimed first and second thresholds) and he summed the magnitude of the real and imaginary parts of the self correlation (page 5, equation 7) (claimed 'magnitude of the real part of the sum of the self correlations and the magnitude of the imaginary part of the sum of the self correlations') before comparing them with the first and second threshold (page 5, paragraphs 0061-0065) (claimed comparison of the magnitude of summed sums and summed magnitudes to a second threshold).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to implement the teachings of Husted into Marshall in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

Regarding claim 6:

Marshall discloses all of the subject matter as described above except for specifically teaching a first threshold and second threshold comparison for the summed magnitudes of the self correlations.

Husted discloses, 'processing the sum of the self correlations includes comparing for a period of time the magnitude of the sum of the self correlations to a first threshold and summing magnitudes of the sum of the self correlation that exceed the first

threshold and comparing the summed magnitudes to a second threshold' (page # 5, paragraphs # 0061-0063 & 0065).

It would have been obvious to one of ordinary skill in the art, at the time of invention, to implement the teachings of Husted into Marshall in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

Regarding claim 8:

Marshall discloses all of the subject matter as described above except for specifically teaching determination of packet boundary based on the time and the sum of the self correlation is maximum.

Husted teaches, 'processing the sum of the self correlations includes determining a packet boundary based on the time when the sum of the self correlations is determined to be a maximum' (page # 5, paragraphs # 0061, 0063 & 0064).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to implement the teachings of Husted into Marshall in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

Regarding claim 11:

Marshall discloses all of the subject matter as described above except for specifically teaching resetting the sum to zero.

Husted teaches, 'resetting the sum of the self correlations to zero upon the occurrence of an automatic gain control adjustment' (figure 3, page # 4, paragraph # 0043-0048) (it is noted in the mentioned paragraphs that if the acc_count counter is zero, accumulator adcpwr1 is being reset and it happens during AGC operation (page # 4, paragraph # 0043-0045) (claimed 'occurrence of an automatic gain control'), furthermore, AGC 230 takes the power measurement from power detector 220, which is connected to self correlation 225, (figure 3, page # 2, paragraph # 0024) and these measurements involves maximum output zero based on the log table calculation (page # 3, paragraph # 0035) which reads on claim limitations of 'resetting the sum of the self correlations to zero' since both power detector 220 and self-correlator 225 are connected together in order to output the signal to the AGC control 230 (figure 3).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to implement the teachings of Husted into Marshll in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

Regarding claim 14:

Marshall discloses all of the subject matter as described above except for specifically teaching reducing the number of bits.

Husted teaches, 'rescaling the received signal to reduce the number of bits required for cross correlation and self correlation' (page # 2, paragraph # 0022, lines 6-13).

It would have been obvious to one of ordinary skill in the art, at the time of invention was made, to implement the teachings of Husted into Marshall in order to differentiate desired in-band signals from high power out-of-band signals that overlap into the target band by verifying the in-band signals by a multi-threshold comparison of the normalized self-correlation to verify the presence of a new, desired in-band signal as taught by Husted (see Abstract) thus provide an automatic gain control system for a receiver.

7. Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (5, 598,429) in views of Muratani et al. (7,123,744) and Chang et al. (US 2004/0146091), as applied to claim 1 above, and further in view of Kim (7,012,881).

Regarding claim 7 and 13:

Marshall discloses all of the subject matter as described above except for specifically teaching determination of frequency offset.

Kim discloses, 'processing the sum of the self correlations includes determining a frequency offset from the phase of the sum of the self correlations' (figures 2 & 3, col.8,

lines 40-67), 'including determining a frequency offset from the angle of the sum of the self correlations' (figures 2 & 3, col.8, lines 40-67).

It would have been obvious to one of the ordinary skill in the art, at the time of invention was made, to implement the teachings of Kim into Marshall in order to estimate frequency offset for OFDM and achieve frequency synchronization as taught by Kim (col.3, liens 39-54) thus enhance system performance.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Husted et al. (US 2004/0235439) discloses a system and method for selective disregarding in a co channel communication.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIRDEPAL SINGH whose telephone number is (571) 270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off) 8:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. S./
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611